UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,368	11/03/2003	Akio Nishiyama	F03-161820M/NY	9407

21254 7590 04/24/2008

MCGINN INTELLECTUAL PROPERTY LAW GROUP, PLLC
8321 OLD COURTHOUSE ROAD
SUITE 200
VIENNA, VA 22182-3817

EXAMINER	
TORRES, JOSE	
ART UNIT	**PAPER NUMBER**
2624	
MAIL DATE	**DELIVERY MODE**
04/24/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/698,368	NISHIYAMA, AKIO	
	Examiner	Art Unit	
	JOSE M. TORRES	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 February 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Comments

1. The Amendment – After Non-Final Rejection filed on February 25, 2008 has been entered and made of record.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 23 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 23 recites the limitation "the other compression process" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim. However, it appears to be "the another compression process" and has been treated as such. Affirmation of this is required by the appropriate amendment.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-6, 8-16 and 19-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Taylor et al. ("Adaptive Image Compression for Wireless Multimedia Communication", IEEE International Conference on Communications, Vol. 6, 11-14 June 2001, pp. 1925-1929).

Re claim 1: Taylor et al. disclose an image compression method for compressing image data ("Adaptive Image Compression"), comprising: storing ("image quality parameters table is stored inside the multimedia capable radio") compression characteristic data ("quantization level and compression ratio") indicating compression characteristics of plural images having plural complexities ("each possible image quality and VBS combination", see Figure 7, Page 1928, Left Col., First two Paragraphs); acquiring an initial compression parameter ("the algorithm identifies the quantization level (curr_QL)", Page 1928, Right Col., Last Paragraph through Page 1929, Left Col., First Paragraph); performing a compression process on image data of an image to be compressed based on the initial compression parameter (In order to obtain all the results of the Table shown in Figure 7, a compression process needs to be employed in the first two steps of the complete methodology shown in Figure 6, see Page 1927, Left Col.,

Last two Paragraphs and Page 1928, Left Col., First two Paragraphs); acquiring a corrective compression parameter ("run-time selection of image compression parameters in order to minimize the energy consumption", Page 1926, Right Col., First two Paragraphs); and performing another compression process on the image data of the image to be compressed on the corrective compression parameter ("optimal JPEG image compression parameters ... quantization level (QL)", Page 1928 Left Col., Last two Paragraphs and Page 1929, First Col., first Paragraph), wherein the compression characteristics indicates a relationship between a bit rate ("compression ratio"), which is a ratio between data volume and the number of pixels of image data, and a compression parameter ("quantization level") associated with image quality and compression rate, wherein said acquiring an initial compression parameter acquires the initial compression parameter based on compression characteristics data of an average image ("Since image quality and compression ratio values vary from image to image, an average over a large number of images is used") and a target bit rate (The target bit rate is that which falls within the wireless multimedia communication constrains), and wherein said acquiring corrective compression parameter includes: acquiring from among said plural complexities (e.g. Image Quality (PSNR) 32dB, 31dB, 30dB, etc.), a complexity of the image to be compressed based on a bit rate of compressed image data acquired in performing said compression process, and said initial compression parameter; and acquiring from the compression characteristics data the corrective

compression parameter based on the acquired complexity of said image to be compressed and the target bit rate (As it is sated on Page 1929 Right Col., Bottom Paragraph, "It is assumed that the computation energy for compressing a full-color, 704x512 size image with a VBS=8 is equal to the energy consumed in transmitting a 30dB image compressed at VBS=8 (31kB)." What is meant by this assertion is that the Adaptive Radio is capable of acquiring an image quality, for which the constraints are met, and utilizing the compression parameters (quantization level and VBS) found for this acquired quality for the image to be compressed and transmitted, see Abstract, Section I. Introduction, pp.1925-1926 and Section **Algorithm fro run-time selection of image compression parameters**, pp. 1928-1929.).

Re claim 2: Taylor et al. disclose the compression process comprises a compression process based on Joint Photographic Expert Group ("Independent JPEG Group's C code, Page 1926, Last Paragraph) standard, and the compression parameter comprises a Q-value ("quantization level", Page 1927, Section *A. Effects of Varying Quantization Level*).

Re claim 6: Taylor et al. disclose said compression process comprises at least one of a discrete cosine transform ("DCT"), a quantization process ("frequency component is quantized"), and a Huffman coding process ("quantized values are then encoded using a Huffman encoding-based technique", See Figure 2 and

Page 1926, Section II. EFFECTS OF VARYING JPEG IMAGE COMPRESSION PARAMETERS ON ENERGY, LATENCY, AND IMAGE QUALITY).

Re claim 8: Taylor et al. disclose determining said compression characteristics by: performing a compression process on sample image data ("All numbers presented are an average across four different images") for a sample image ("Since image quality and compression ratio values vary from image to image, an average over a large number of images is used") using a predetermined compression parameter ("each VBS and quantization level"), to acquire a bit rate ("number of bits to transmit") from a data volume ("31kB") of compressed sample image data and the number of pixels of said sample image ("704x512 size image", See Page 1926, Right Col., Last Paragraph through Page 1927, Left Col., First Paragraph, Page 1928, Left Col., First two Paragraphs and Page 1929, Right Col., Bottom Paragraph).

Re claim 9: Taylor et al. disclose repeating said compression process on said sample image data plural times using different compression parameters ("each VBS and quantization level", Page 1928, Left Col., First two Paragraphs).

Re claim 10: Taylor et al. disclose said sample image comprises plural images of varying complexities (e.g. Image Quality (PSNR) 32dB, 31dB, 30dB, etc., see Figure 7 and Page 1928, Left Col., First two Paragraphs.).

Re claim 11: Taylor et al. disclose storing said compression characteristics comprises storing said compression characteristics in one of a table ("the image quality parameters table is stored inside the multimedia capable radio") and a function for approximating said compression characteristics (Fig. 7. Example Image Quality Parameters Table).

Re claim 12: Taylor et al. disclose acquiring said target bit rate from number of pixels of said image data of said image to be compressed and a target data volume of compressed image data (The target bit rate is directly related to the target data volume which is acquired when the selection step is being performed based on the conditions and constraints for mobile communication, see Section I and Section III Energy Savings Due to Adaptive Image Compression, Pages 1925 and 1929.).

Re claim 13: Taylor et al. disclose acquiring a data volume of said compressed image data generated by the compression process (The data volume acquired is obtained once the image is compressed based on the compression parameters).

Re claim 14: Taylor et al. disclose judging whether said acquired data volume is within a range of limitation (When the selection step is being performed the image quality is tested to see if it meets the required limit to satisfy the constrains, See Section III Pages 1927-1929).

Re claim 15: Taylor et al. disclose if said acquired data volume is within said range of limitation, terminating said compression process (The process is repeated until the optimal parameters are found, see Section III Pages 1928-1929).

Re claim 16: Taylor et al. disclose if said acquired data volume is other than within said range of limitation, performing said acquiring said corrective compression parameter, said acquiring said corrective compression parameter further comprising: acquiring a bit rate, of said compressed image data; acquiring a function that gives said bit rate of said compressed image data for said initial compression parameter with reference to said compression characteristics data; acquiring another compression parameter by using said target bit rate and said acquired function; and repeating said performing said compression process using said another compression parameter and said judging whether said data volume of said compressed image data is within said range of limitation until said data volume of said compressed image data is within said range of limitation (As disclosed with respect to FIG. 9 Algorithm for step 3, in order to make a selection the data volume needs to be within the limitation range, if not, the process is repeated until the optimal parameters are identified, see FIG; 9, Section III Pages 1928-1929).

Re claim 20: Taylor et al. disclose wherein said acquiring said complexity of said image to be compressed comprises acquiring the following function corresponding to said image to be compressed: Q=f(r), where Q denotes the compression parameter and R denotes the bit rate (As shown in the Algorithm of FIG. 9, the quantization level is chosen while the latency and bandwidth constrains are met, and since the energy is calculated for each image quality and VBS, the rate (image_size *curr_CR) is related to the Quantization Level, see Section III Pages 1928-1929).

Re claims 3, 4, and 21: Taylor et al. disclose an image compression apparatus as claimed in at least the Multimedia Capable Radio, which inherently consists of at least a memory to store the Image Quality Parameters Tables and a processor to execute the compression process and the parameter acquisition. (See Abstract, Section II, Section III Pages 1925-1929, and Claims 1, 2, and 20 above.).

Re claims 5, 19 and 22: Taylor et al. disclose an image compression apparatus/computer as claimed (Similar to claim 3 above) in at least the Multimedia Capable Radio, which inherently consists of at least a memory to store the Image Quality Parameters Tables and a processor to execute the compression process and the parameter acquisition. (See Abstract, Section II, Section III Pages 1925-1929, and Claims 1 and 20 above.).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 7 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor et al. in view of Kuniba (U.S. Pat. No. 6,697,529). The teachings of Taylor et al. have been discussed above.

As to claim 7, Taylor et al. does not explicitly disclose said Q-value comprises a variable between 0 and 1, and an image quality of a compressed image formed by compressed image data is improved by increasing said Q-value.

Kuniba teaches said Q-value ("Initial Scale Factor ISF") comprises a variable between 0 and 1 ("0.1, 0.3, and 1.0"), and image quality of a compressed image formed by said compressed image data is improved by increasing said Q-value (As can be shown the ISF values are between 0 and 1, and the amount of data obtained varying the factor is directly proportional to the scale factor, therefore, obtaining more data corresponding to better image quality. FIG. 4, S**35**, Col. 6 line 63 through Col. 7 line 10).

Therefore, in view of Kuniba, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Taylor et al.'s method by incorporating the method step of varying the Q-value between 0 and 1, and improving the image quality by increasing the Q-value in order to execute quantization that

corresponds to the quality and the content of the input data in a flexible manner (Col. 4 lines 8-23).

As to claim 17, Taylor et al. does not explicitly disclose an input device for inputting said image data and target data volume for performing said compression process; and an output device for outputting said compressed image data.

Kuniba teaches an input device (FIG. 1, "Input Section that comprises Input Device **13** such as a keyboard, and External Apparatus **23** such as an electronic camera.") for inputting said image data and target data volume for performing said compression process; and an output device (FIG. 1, "Monitor **19**") for outputting said compressed image data (The keyboard is used by the developer to input the information such as the target compression rate desired, the electronic camera to input the image data, and the monitor to output the compressed image. Col. 6 lines 26-37).

Therefore, in view of Kuniba, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Taylor et al.'s apparatus by incorporating an input and output device in order to have an apparatus with flexible parameter inputting and contemplating the visual appearance of the image once it is compressed (Col. 6 lines 26-45).

8. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor et al. in view of Yovanof et al. (U.S. Pat. No. 5,677,689). The teachings of Taylor et al. have been discussed above.

As to claim 18, Taylor et al. does not explicitly disclose that the apparatus comprises a digital camera.

Yovanof et al. teaches a digital camera ("KODAK DCS200 Digital Camera") comprising an image compression apparatus (Col. 8 line 64 through Col. 9 line 2).

Therefore, in view of Yovanof et al., it would be obvious to one of ordinary skill in the art at the time the invention was made to modify Taylor et al.'s image compression apparatus by incorporating it on a digital camera in order to easily accomplish storage requirements for permanent storage and working buffer (Col. 9 lines 12-20).

9. Claims 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor et al. in view of Maeda (U.S. Pat. No. 6,067,382). The teachings of Taylor have been discussed above.

As to claim 23, as understood, 24 and 25, Taylor et al. does not explicitly disclose if a bit rate of the compressed image data of the image to be compressed is larger than the target bit rate, the another compression process is performed on the image data of the image to be compressed based on the corrective compression parameter.

Maeda teaches if a bit rate of the compressed image data ("bit rate variable br") of the image to be compressed is larger than the target bit rate ("larger than the target bit rate BR"), the another compression process is performed on the image data of the image to be compressed based on the corrective compression parameter ("scale variable Q is incremented", Col. 22 line 17 through Col. 23 line 4).

Therefore, in view of Maeda, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Taylor et al. by incorporating the method step of performing another compression process based on an incremented scale variable Q when the bit rate of compressed image data is larger than the target bit rate in order to efficiently obtain code data with code length that a user desires upon encoding an input image, and can attain encoding while maintaining high image quality (Col. 6 lines 45-49).

Response to Arguments

Claim Rejections under 35 U.S.C. §102

10. With respect claims 1-6, 8-16 and 19-22 Applicant's arguments have been fully considered but they are not persuasive. Applicant submits that Taylor does not teach or suggest "wherein said acquiring said corrective compression parameter includes: acquiring from among said plural complexities, a complexity of the image to be compressed based on a bit rate of compressed image data acquired in performing said compression process, and said initial compression parameter; and acquiring from the compression characteristics data the corrective compression parameter based on the acquired complexity of said image to be compressed and the target bit rate" (See Remarks, Page 10 line 29 through Page 11, line 4). In addition, Applicant alleges that the Examiner "is attempting to equate the "quantization value" in Taylor with the "complexity" of the image in the claimed invention" (See Remarks, Page 11 lines 25-26). Also, Applicant alleges that nowhere in Sections II or II or anywhere else in Taylor, does

teach "storing compression characteristics data indicating compression characteristics of plural images having plural complexities (Remarks, Page 12 lines 2-4), and that Taylor certainly does not teach or suggest acquiring a corrective compression parameter including acquiring from among the plural complexities, a complexity of the image to be compressed based on a bit rate of compressed image data acquired in performing the compression process, and the initial compression parameter (Remarks, Page 12 lines 4-8). Examiner respectfully disagrees.

Firstly, Taylor et al. teaches an image compression methodology consisting of three steps. The first two steps precompute an image quality parameters table consisting of the quantization level and compression ratio (in bits per pixel) for each possible image quality (PSNR) and Virtual Block Size (VBS). The third step, performed on-line in the multimedia capable radio, uses the image quality parameters table to select the optimal image compression parameters for the current latency, bandwidth, and quality of image requirements, along with the current transmission energy/bit. Further, it is stated that as an example it is assumed that the computation energy for compressing a full-color, 704x512 size image with a VBS=8 is equal to the energy consumed in transmitting a 30dB image compressed at VBS=8. Therefore, among the plural complexities (images having a PSNR of 30, 31, and 32dB), the image corresponding to 30dB having a VBS=8 is chosen because it meets the constraints requirements imposed by the multimedia capable radio carrier. Secondly, the "complexity" of an image as claimed is defined as relationship between a compression parameter and a bit rate of image data generated by using said compression parameter.

As shown in Figure 7 of Taylor et al., each Image Quality and VBS combination is related to a Quantization Scaling Factor (between 0 and 100) and a compression ratio (bits/pixel), such an example (30dB and VBS=8) with a Quantization Scaling Factor of 73 and a compression ratio of .688 bits/pixel.

Thirdly, it is expressly disclosed in Taylor et al. (Page 1928, Left Col., Bottom Paragraph) that "the image quality parameters table is stored inside the multimedia capable radio". Finally, the run-time selection step with respect to the algorithm shown in Figure 9, selects the appropriate quantization level once the constraints are known, and having the results of image compression performed for the creation of the image quality parameters table, which includes the initial values utilized.

Therefore, the rejections are maintained.

Claim Rejections under 35 U.S.C. §103

11. With respect to claims 7, 17 and 18, Applicant's arguments have been fully considered but they are not persuasive.

In response to Applicant's argument that there is no suggestion to combine the references (Remarks, Page 12 lines 29-30), the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5

USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

In this case, Kuniba (U.S. Pat. No. 6,697,529) disclose a Data Compression Method and Recording Medium with Data Compression Program Recorded Therein, classified in Class 382 (Image Analysis), Sub-class 239 (Adaptive Coding), similar to the instant Patent Application, therefore, within the same field of art. Further, as it is stated in Kuniba's abstract there is disclosed a coding technique which achieves a target volume by the adjustment of “parameters”.

Therefore, in view of Kuniba, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Taylor et al. varying the Q-value between 0 and 1 in order to execute quantization that corresponds to the quality and the content of the input data in a flexible manner (Col. 4 lines 8-23). A person of ordinary skill in the art would immediately recognize this feature because the ultimate object of image compression is the ability to obtain an image similar to the raw version, with the less perceptible visual distortion visible by the human eye.

Yovanof et al. (U.S. Pat. No. 5,677,689) clearly discloses a JPEG compliant still image compression system embodied on a digital camera (Col. 8 line 64 through Col. 9 line 2). Therefore, in view of Yovanof et al., similar to Taylor et al., obvious to incorporate into a digital camera in order to implement a coding system efficiently in either speed or memory bound systems.

Therefore, the rejections are maintained.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Maeda et al. disclose a Modification of detected quantization step size from the encoded bitstream based on a region of interest (ROI) bitmask.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSE M. TORRES whose telephone number is (571)270-1356. The examiner can normally be reached on M-F: 8:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMT
04/22/2008

/Jingge Wu/

Supervisory Patent Examiner, Art Unit 2624